CLAIMS

1. A method for creating an electron lens, comprising the steps of:
applying a polymer layer on an emitter surface; and
curing the polymer layer to reduce volatile content.

2. The method of claim 1, further comprising the steps of:
applying a first conductive layer on the polymer layer;
applying a photoresist layer on the first conductive layer;
patterning the photoresist layer to define an electron lens; and
etching the first conductive layer to create an opening.

3. The method of claim 2 wherein the step of patterning the photoresist layer includes the step of patterning the photoresist layer to define a shield layer.

4. The method of claim 2, further comprising the step of etching the polymer layer within the opening with a selective etch such that the ratio of etching of the polymer layer to the emitter surface is greater than 1000:1.

5. The method of claim 4 wherein the photoresist layer is not removed before the step of etching the polymer layer with the selective etch.

6. The method of claim 4 wherein the polymer etch process conditions are set to balance the conditions between etch rate, etch residue, etch profile, and minimum DC bias.

7. The method of claim 4 wherein the etch profile has an undercut of about 1 micron to about 2 microns per about 6.5 microns of etch depth.

8. The method of claim 2 wherein the step of applying a first conductive layer further comprises the step of applying a conductive layer with a temperature expansion coefficient similar to the cured polymer layer.

9. The method of claim 2 wherein the step of applying a first conductive layer further comprises the step of applying a malleable conductor.

10. An electron lens created by the process of claim 1.

11. A focused electron emitter created using the process of claim 1.

12. A method for creating an electron lens, comprising the steps of:

applying a polymer layer on an emitter surface;

curing the polymer layer to reduce volatile content.

applying a first conductive layer on the polymer layer;

applying a photoresist layer on the first conductive layer;

patterning the photoresist layer to define an electron lens; and

etching the first conductive layer to create an opening.

13. The method of claim 12 wherein the step of patterning the photoresist layer includes the step of patterning the photoresist layer to define a shield layer.

14. The method of claim 12, further comprising the step of etching the polymer layer within the opening with a selective etch such that the ratio of etching of the polymer layer to the emitter surface is greater than 1000:1.

15. The method of claim 14 wherein the photoresist layer is not removed before the step of etching the polymer layer with the selective etch.

16. The method of claim 14 wherein the polymer etch process conditions are set to balance the conditions between etch rate, etch residue, etch profile, and minimum DC bias.

17. The method of claim 14 wherein the etch profile has an undercut of about 1 micron to about 2 microns per about 6.5 microns of etch depth.

18. An electron lens created by the process of claim 12.

19. A focused electron emitter created using the process of claim 12.

20. A method for creating an electron lens, comprising the steps of:

applying a polymer layer on an emitter surface;

curing the polymer layer to reduce volatile content.

applying a first conductive layer on the polymer layer;

applying a photoresist layer on the first conductive layer;

patterning the photoresist layer to define an electron lens;

etching the first conductive layer to create an opening; and

etching the polymer layer within the opening with a selective etch such that the ratio of etching of the polymer layer to the emitter surface is greater than 1000:1.

21. The method of claim 20 wherein the step of patterning the photoresist layer includes the step of patterning the photoresist layer to define a shield layer.

22. The method of claim 20 wherein the photoresist layer is not removed before the step of etching the polymer layer with the selective etch.

23. The method of claim 20 wherein the polymer etch process conditions are set to balance the conditions between etch rate, etch residue, etch profile, and minimum DC bias.

24. The method of claim 20 wherein the etch profile has an undercut of about 1 micron to about 2 microns per about 6.5 microns of etch depth.

25. An electron lens created by the process of claim 20.

26. A focused electron emitter created using the process of claim 20.

27. An electron lens for an electron emitter, comprising:

a focusing lens layer; and

a polymer spacer layer between the focusing lens layer and the electron emitter.

28. The electron lens of claim 27 wherein the polymer spacer material is between about 2 microns and about 12 microns thick.

29. The electron lens of claim 27 wherein the polymer spacer layer has been cured to remove volatile content.

30. A focused electron emitter comprising the electron lens of claim 27.

31. An electronic device comprising at least one electron lens of claim 27.

32. A focused metal insulator semiconductor emitter, comprising:

a tunneling layer less than about 500 angstroms in thickness disposed on a semiconductor substrate;

a polymer spacer layer disposed on the semiconductor substrate and defining a first opening disposed over the tunneling layer;

a focusing lens layer disposed on the polymer spacer layer and defining a second opening disposed over the tunneling layer; and

a cathode layer disposed on the tunneling layer.

33. The electron lens of claim 32 wherein the polymer spacer material is between about 2 microns and about 12 microns thick.

34. The electron lens of claim 32 wherein the polymer spacer layer has been cured to remove volatile content.

35. An electronic device comprising at least one electron lens of claim 32.

36. The electronic device of claim 35 wherein the electronic device is a display device.

37. The electronic device of claim 35 wherein the electronic device is a mass storage device.

38. A focused electron emitter, comprising:

a tunneling layer less than about 500 angstroms in thickness;

means for focusing electrons emitted from tunneling layer; and

polymer means for spacing the means for focusing electrons from the tunneling layer wherein the polymer means has been cured to remove volatile components.

39. The focused electron emitter of claim 38 wherein the tunneling layer is about 100 Angstroms.

40. The focused electron emitter of claim 38 wherein the means for focusing electrons and the polymer means for spacing have substantially the same temperature expansion coefficient.